

Analyzing the Quality of Motorcycle Taxi Services in Agricultural Product Transportation: A Structural Equation Modeling (SEM) Approach

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Abstract— Pinrang Regency is one of the largest rice producers in South Sulawesi Province, Indonesia, where the main occupation of the population is farming. The need for transportation of agricultural products is very much needed and what is used by the farming community is a modified vehicle, namely a motorcycle taxi. This research aims to determine the level of service quality based on characteristics. The research method uses descriptive quantitative based on a questionnaire survey of 130 respondents with the Structural Equation Model analysis model assisted by Analysis Moment of Structure software version 23. The results of the research analysis show that the Service Quality variable has a positive and significant effect on Customer Satisfaction, Service Quality has a positive and significant effect on Customer Loyalty, Price Fairness has a positive and significant effect on Customer Loyalty, Customer Satisfaction has a positive and significant effect on Customer Loyalty, because the Critical Ratio value shows value >1.960 and P-value <0.005 the hypothesis in this research can be accepted, while the Price Fairness variable has no significant effect on Customer Satisfaction because the P-value is 0.612.

I. INTRODUCTION

Transportation is a supporter of human activities and has become one of the basic human needs that is inseparable from human life itself [1]. Transportation is the activity of moving goods and people from a place of origin to a destination [2] . There are three things related to transportation, namely there is a load to be transported, a vehicle is available as a means of transportation and there is a road that can be used [3]. Factors that influence the level of transportation growth in a region are geographical,

economic, technological, social, political and environmental factors [4].

Transportation functions as a supporting and stimulating factor for development and as a service provider for economic development [5] . Rural transportation is transportation that functions to facilitate (reach) rural communities to distribute information and all services in rural areas [6]. Rural vehicles are needed to help productivity and mobilize agricultural products so as to encourage increased economic activity . Previous research showed that the transportation mode for transporting

agricultural products, namely motorcycle people in South Sulawesi to transport agricultural products. Apart from that, taxi motorcycles are very good to use, especially during the harvest season so that people modify them or become operators as additional livelihoods apart from being farmers Motorcycle Taxi is an activity of transporting agricultural products using a modified motorcycle. farmers [7].

Choose to use motorcycle taxis because they are able to transport tens or even hundreds of sacks of grain per day depending on the distance and terrain conditions so that the farmer's grain is not damaged due to weeks of rain in the middle of the rice fields [8]. Service quality is a factor that determines the level of success in providing quality services to consumers and as a strategy to defend themselves and achieve success in facing competition [9]. The Servqual dimensions developed have become the basis for the development of service quality, namely tangibles, reliability, responsiveness, assurance and empathy [10]. The basic meaning of service quality is all forms of activities carried out to meet consumer needs. Meanwhile, service is defined as the service provided by the owner in the form of convenience, speed, relationship, ability and friendliness as demonstrated by attitudes and traits in providing services for customer satisfaction [11]. Service quality is the suitability of product use to meet customer

needs and satisfaction, where quality is used as a benchmark [12]

Satisfaction contains significant differences in the definition of satisfaction, all definitions have several elements in common. When examined as a whole, three general components can be identified: 1) customer satisfaction is a response (emotional or cognitive); 2) the response is related to a particular focus (expectations, product, consumption experience); and 3) the response occurs at a certain time (after consumption, after selection, based on accumulated experience) [13]. Customer responses follow a general pattern similar to the literature. Satisfaction consists of three basic components, a response related to a certain focus determined at a certain time. Customer satisfaction is a feeling of pleasure or disappointment that arises after comparing the performance of the product in question with the expected performance. From the definition of whether the service provided does not match the expectations of Go-Ride customers and if the expectations set are too low, then consumers will feel dissatisfied and disappointed, if performance matches expectations then customers will feel satisfied, what is provided exceeds expectations, then customers will feel happy and very satisfied.

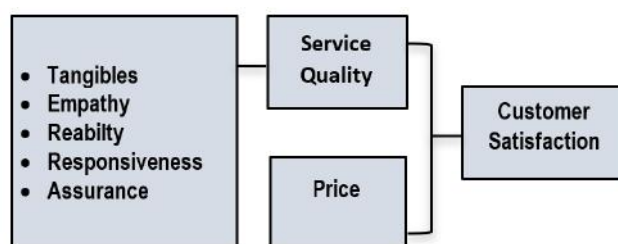


Fig.1. Indicators for measuring consumer satisfaction

There are five factors that cause customers to be loyal to the products/services they use: 1) Brand value; Customer perceptions that compare the costs or prices that must be borne with the benefits they receive. 2) Customer characteristics; In using a brand, each individual has different characteristics from other individuals. 3) Service Quality; [14]. If the customer's perception of the quality of service experienced is of high quality, it will have a positive effect. 4) Customer satisfaction; Related to the consumer's

experience when making contact with the brand they use. This factor is very important, but customer satisfaction alone is not enough to cause a customer to remain loyal to a brand. 5) Trust; This concerns the extent of competitive rivalry between beliefs in a product or service category. It can be interpreted that customer loyalty is a strong commitment to repurchase a product or service consistently in the future [15].

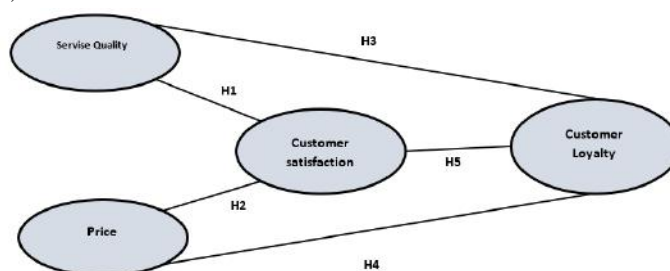


Fig.2. Frame of mind

The relationship between service quality and customer satisfaction : Service quality has a positive effect on customer satisfaction [15]. Customer satisfaction is an independent construct and is influenced by service quality, as well as customer loyalty is influenced by service quality. Pricing is directly related to the income received. Pricing must be appropriate so that consumers can be considered in making decisions when reusing [16]. The relationship between service quality and customer loyalty : Service quality has a positive influence on customer loyalty , stating that satisfaction has a positive influence on customer loyalty also expressed the same thing that satisfaction has a positive relationship with loyalty, however increasing satisfaction does not always result in increasing loyalty to the same degree. The relationship between price and customer loyalty has a positive effect on customer loyalty [17]. States that prices can also be regulated to prevent competitors from entering, to maintain customer loyalty, support repeat sales and so on. Apart from price, service quality also influences customer loyalty, where price has a significant influence on customer loyalty. The relationship between customer satisfaction and customer loyalty has a positive effect on customer loyalty [18] . That customer satisfaction is a factor that influences customer loyalty. where satisfaction has a significant influence on customer loyalty [19]. Customer satisfaction is an encouragement to individual desires which are directed at the goal of obtaining satisfaction [20]. Customers will be loyal to a product or service offered when they get satisfaction from the product or service. This research provides a clearer picture of the positive impacts felt by farmers. Initially modified motorcycles were used by farmers in what were known as taxi motorcycles, these motorcycles were designed for slippery and muddy terrain. Based on several studies that have been conducted in Sidenreng Rappang district, this research aims to find out

the level of satisfaction and loyalty of farmers who use motorcycle taxis as a means of transporting agricultural products based on the characteristics of farmers, especially in Pinrang district using Sem Amos analysis.

II. METHODOLOGY

Research Method

This research uses a descriptive quantitative method, namely by looking for information about existing symptoms. Data such as service quality, rates, satisfaction and loyalty were collected through observation, interviews and questionnaire surveys with 130 respondents directly and randomly in the field for 3 to 6 months and then analyzed using Analysis Moment of Structure (Amos) version 23 software. Respondents answered each question variable based on the answer choices given using a Likert scale (Strongly agree, agree, disagree, disagree and strongly disagree [21]

Analysis Techniques

The steps for conducting Sem analysis using the Amos program according to [22] are as follows: 1.) Create a model specification based on theory, then determine how to measure the construct, collect data and then enter the data into the Amos program. 2.) Amos will fit the data into the specified model, then provide results that include all model fit statistics and parameter estimates. 3.) Enter the data which is usually in the form of a covariance matrix of the variables being measured, for example the value of the question items used. Other forms of input can be correlation matrices and averages. Data can be raw data and then converted into covariance and average. 4.) Make estimates according to research needs. 5.) Match the data with the model that has been created.



Fig.3. Motorcycle Taxi Activities

III. RESULT AND DISCUSSION

Respondent Characteristics

Table 1. Respondent Characteristic

Characteristics	Indikator	Percent (%)
Gender	Male	100
	Female	0
Age	< 35	6.9
	36-45	33.8
	46-55	55.4
	> 56	6.9
last education	Elementary school	63.0
	Junior High School	28.5
	Senior High School	6.2
	College	2.3
Job status	Main	73.1
	Side	26.9
Marital status	Married	100
	Single	0
Land area	> 1 Ha	31.4
	< 1 Ha	68.6
Price per-trip	< IDR15.000	79.2
	> IDR 15.000	20.8

Note: US\$ 1= IDR15.100 (Indonesian exchange rate 2023)

Based on table 1, the results of the analysis of respondents' characteristics are based on gender, male with a percentage of 100% and female 0%. The age range of 56–65 years with a percentage of 6.9%, 36–45 years 33.8%, 46–55 years 55.4% and 27–35 years 6.9% indicates that the age of farmers is predominantly quite old and only a small percentage is old. still young. The final education level is elementary school with a percentage of 63.0%, junior high school 28.5%, high school 6.2% and College education 2.3% indicating that farmers generally have low education which cannot be absorbed into the formal sector and very few have a bachelor's degree and the farmer sector is used as side jobs other than as a civil servant/private employee. Based on the main job status as a farmer with a percentage of 73.1% and secondary 26.91%. Marital status is married with a percentage of 100% and unmarried 0%. The average

area of cultivated rice fields is <1 Ha with a percentage of 68.6% and >1 Ha is 31.4%. Based on the transportation costs for agricultural products per transport <IDR. 15,000, the percentage is 79.2%, > IDR. 15,000 20.8% indicates that the price or transportation costs are still tentative or can change according to the agreement between the farmer and the operator based on the transportation distance and the work carried out individually. group or individual wholesale.

Normality Test

Structural Equation Modeling (SEM) which uses *Maximum Likelihood Estimation* (MLE) assumes that the data is normally distributed. This normality test uses the Multivariate critical ratio criterion of ± 2.58 [23].

Table 2. Normality test

Variable	min	Max	Skew	c.r.	kurtosis	c.r.
CL5	4.000	7.000	,419	-1949	,134	,334
CL4	4.000	7.000	,219	1,019	-,175	-,407
CL3	4.000	7.000	-,287	-1,336	-,692	-1,611
CL2	4.000	6.000	-,134	-,626	-1,088	-2,532
CL1	4.000	6.000	-,618	-2,876	-,776	-1,805
CS1	4.000	6.000	-,293	-1,363	-1,508	-3,509
CS2	4.000	7.000	-,143	-,666	-,972	-2,262
CS3	4.000	6.000	-,453	-2,107	-1,378	-3,208
PF2	4.000	7.000	-,453	,692	-,156	-,363
PF2	4.000	7.000	-,149	,169	-,217	-,505
SQ12	4.000	6.000	,036	,090	-1,283	-2,986
SQ13	4.000	6.000	,019	,492	-1,567	-3,646
SQ9	4.000	7.000	,106	1,035	-,875	-2,038
SQ10	4.000	7.000	,222	,154	-,782	-1,820
SQ11	5.000	6.000	,033	2,208	-1,775	-4,131
SQ7	5.000	7.000	,474	1,657	-1,464	-3,407
SQ8	4.000	6.000	,356	-,501	-1,582	-3,682
SQ3	4.000	6.000	-,108	-,597	-,930	-2,164
SQ4	4.000	6.000	-,128	,845	-,924	-2,151
SQ5	4.000	7.000	,182	,726	-,531	-1,237
-1,950	5.000	6.000	,156	,287	-1,996	-4,646
,765	4.000	7.000	,062	,139	-,286	-,666
SQ2	5.000	6.000	,030	1,302	-1,922	-4,473
Multivariate			,280		13,099	2,202

Based on table 2, the analysis results show that the multivariate c.r value is 2.202. This value is not greater than 2.58 and not less than -2.58, so it can be concluded that the data distribution used meets the normality criteria.

Test the validity of the Price Fairness variable

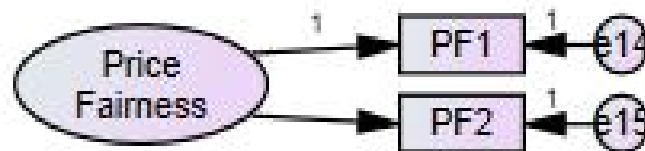


Fig.4. CFA Variable Price Fairness

Table 3. CFA Price Fairness Results

Variabel	Estimate	S.E.	C.R.	P	Label
PF1 <-- Price fairness	1,000				
PF2 <-- Price fairness	,644	,305	2,110	,035	P < 0,05 signifikan

Based on Figure 4 and the output results shown in Table 3, it is known that the two indicators used to measure the Price Fairness variable have significant P values. So it can be explained that all significant indicators are used to measure the Price Fairness variable.

Test the validity of the Customer Satisfaction variable

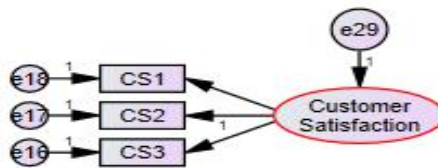


Fig.5. CFA Variable Customer Satisfaction

Table 4. CFA Customer Satisfaction Results

Variabel	Estimate	S.E.	C.R.	P	Label
CS3 <-- CS	1,000				P < 0,05 signifikan
CS2 <-- CS	1,283	,148	8,672	***	P < 0,05 signifikan
CS1 <-- CS	,938	,130	7,210	***	P < 0,05 signifikan

Based on Figure 5 and Table 4, it can be seen that the three indicators used to measure the customer satisfaction variable have a p-value < 0.05, so they can be declared significant, so it can be explained that all significant indicators are used to measure the customer satisfaction variable.

Validity test of service quality variables.

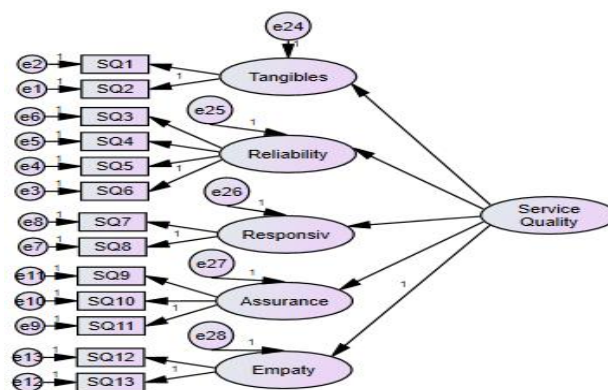


Fig.6. CFA Service Quality Variables

Table 5. CFA Service Quality Result

	Variabel		Estimate	S.E.	C.R.	P	Label
SQ2	<--	Tangibles	1,000				
SQ1	<--	Tangibles	,533	,243	2,200	,028	P < 0,05 significant
SQ6	<--	Reliability	1,000				
SQ5	<--	Reliability	1,718	,515	3,336	***	P < 0,05 significant
SQ4	<--	Reliability	1,799	,574	3,135	,002	P < 0,05 significant
SQ3	<--	Reliability	1,897	,594	3,193	,001	P < 0,05 significant
SQ8	<--	Responsiv	1,000				
SQ7	<--	Responsiv	,619	,137	4,532	***	P < 0,05 significant
SQ11	<--	Assurance	1,000				
SQ10	<--	Assurance	1,237	,244	5,076	***	P < 0,05 significant
SQ9	<--	Assurance	1,124	,256	4,385	***	P < 0,05 significant
SQ13	<--	Empaty	1,000				
SQ12	<--	Empaty	,998	,178	5,592	***	P < 0,05 Significant

Based on Figure 6 and Table 5, it can be seen that the thirteen indicators are used to measure service quality variables. Having a p-value <0.05, it can be declared significant, so it can be explained that all significant indicators are used to measure the service quality variable.

Test the validity of the Customer Loyalty variable

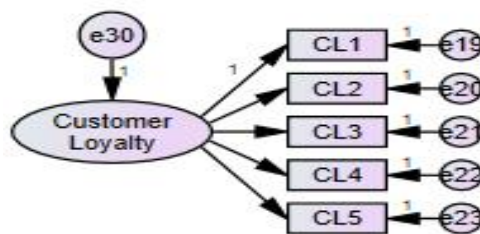


Fig.7. CFA Customer Loyalty Variable

Table 6. CFA Customer Loyalty Results

	Variabel		Estimate	S.E.	C.R.	P	Label
CL1	<--	CL	1,000				P < 0,05 significant
CL2	<--	CL	1,378	,376	3,664	***	P < 0,05 significant
CL3	<--	CL	2,353	,667	3,526	***	P < 0,05 significant
CL4	<--	CL	2,368	,699	3,389	***	P < 0,05 significant
CL5	<--	CL	1,770	,545	3,249	,001	P < 0,05 significant

Based on Figure 7 and Table 6, it can be seen that the five indicators used to measure the customer loyalty variable have a p-value <0.05, so they can be declared significant, so it can be explained that all significant indicators are used to measure the customer loyalty variable.

Reliability Test

Table 7. Reliability Test Results

Variable	Indicator	SFL	SFL Kuadrat	Error	Construct Reliability	Variance Extracted
Price Fairness	PF1	0.709	0.502	0.497	0.753	0.604
	PF2	0.745	0.555	0.444		
Service Quality	SQ2	0.962	0.925	0.074	0.926	0.504
	SQ1	0.412	0.169	0.830		
	SQ6	0.382	0.145	0.854		
	SQ5	0.591	0.349	0.650		
	SQ4	0.661	0.436	0.563		
	SQ3	0.661	0.436	0.563		
	SQ8	0.793	0.628	0.371		
	SQ7	0.492	0.242	0.757		
	SQ11	0.561	0.314	0.685		
	SQ10	0.611	0.373	0.626		
	SQ9	0.572	0.327	0.672		
	SQ13	0.724	0.524	0.475		
	SQ12	0.705	0.497	0.502		
Customer Satisfaction	CS3	0.741	0.549	0.450	0.867	0.594
	CS2	0.869	0.755	0.244		
	CS1	0.69	0.476	0.523		
Customer Loyalty	CL1	0.401	0.160	0.839	0.747	0.519
	CL2	0.555	0.308	0.691		
	CL3	0.759	0.576	0.423		
	CL4	0.717	0.514	0.485		
	CL5	0.594	0.352	0.647		

Based on table 7, the recommended values for construct reliability and extracted variance are above 0.70 and 0.50. (Yusuf Haji-Othman et al., 2022). Based on table 8, it can be seen that the reliability testing results show reliable results because the construct reliability value is ≥ 0.70 and the variance extracted value is also ≥ 0.5 .

Model Fit Test

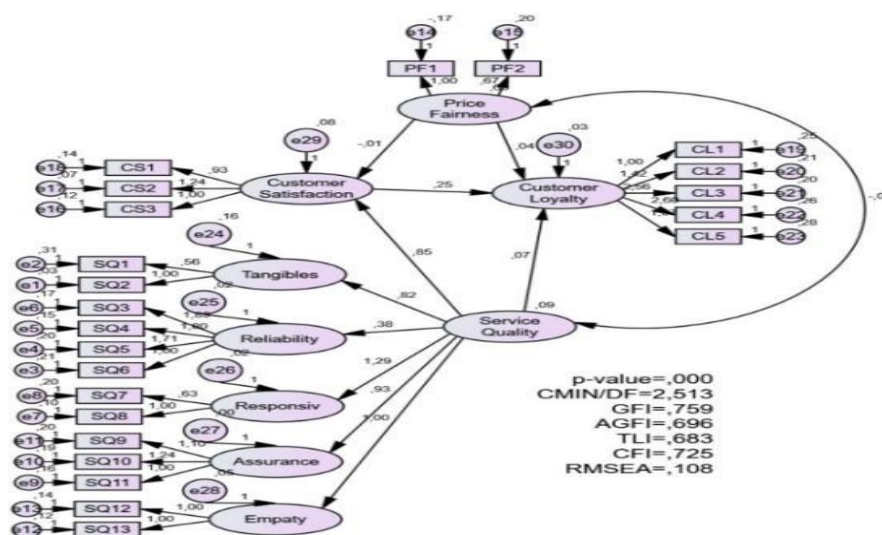


Fig.8. Fit Models

Table 8. Goodness of fit results

Goodness of Fit Index.	Cut off value.	Result	Mode Evaluation
Chi-Square	Expected to be small	559.6	Good fit
Probability	$\geq 0,05$	0.000	Marginal fit
CMIN/DF	$\leq 2,00$	2.555	Marginal fit
GFI	$\geq 0,90$	0.953	Good fit
AGFI	$\geq 0,90$	0.908	Good fit
TLI	$\geq 0,95$	0.676	Poor fit
CFI	$> 0,95$	0.720	Poor fit
RMSEA	$\leq 0,08$	0.110	Marginal Fit

Testing the suitability of the model in figure 8 and table 8 shows that the Chi-Square, GFI and AGFI indices meet the cut off value. This can be interpreted as meaning that the model in the figure above has been confirmed by the data or in other words the model is fit. The data used in this research is able to describe the phenomena that exist in the field. In contrast to the probability value of 0.000 which is smaller than 0.05, CMIN/DF of 2.555 which is greater than 2.00,

RMSEA of 0.08 which is greater than 0.110, it can be said to be marginal fit. Meanwhile, TLI is 0.676, CFI is 0.720, each of which does not meet the cut off value or is in the poor fit ratio. However, it can be concluded that if there are one or more results from the goodness of fit criteria that meet the cut off value, then the model can be declared fit as a whole. [24].

Table 9. Hypothesis testing

Connection	Estimate	S.E	C.R	P- value	Keterangan
CS <-- SQ	0.848	0.178	4.769	***	Significant
CS <-- PF	-0.014	0.028	-0.507	0.612	Unsignificant
CL <-- SQ	0.554	0.115	2.469	0.039	Significant
CL <-- PF	0.341	0.148	3.095	0.011	Significant
CL <-- CS	0.293	0.136	2.152	0.031	Significant

Based on table 9, hypothesis testing shows that the Service Quality variable has a positive and significant effect on Customer Satisfaction, Service Quality has a positive and significant effect on Customer Loyalty, Price Fairness has a positive and significant effect on Customer Loyalty, because the Critical Ratio value shows a value of >1.960 and the P-value value <0.005 so the hypothesis in this research can be accepted [25]. while the Price Fairness variable has no significant effect on Customer Satisfaction because the P-value is 0.612.

IV. CONCLUSION

Motorcycle taxi transportation is a means that supports successful development in supporting the activities of the farming community in Pinrang Regency, South Sulawesi Province, especially in the agricultural products sector. The use of motorcycle taxi services is the community's main choice to help productivity and mobilize agricultural products. Based on the research results, motorcycle taxi customer loyalty is influenced by the level of satisfaction. Therefore, service quality greatly influences customer satisfaction based on tangibles, reliability, responsiveness, assurance, especially on price or prices perceived by farmers using motorcycle taxis which are adjusted to the services provided such as conditions and distance traveled by the operator.

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